

I. Amendments to the Specification

Please replace the specification with the following. A clean version of the amended specification is enclosed as Attachment A.

GUIDE LOOP ELEMENT FOR SEAT BELTS WITH ONE-PIECE CASTING PART

Description

CROSS REFERENCE TO RELATED APPLICATIONS

[0001] This application claims priority to German patent application DE10339562.8, filed August 26, 2003 and PCT/EP2004/008704, filed August 4, 2004.

FIELD OF THE INVENTION

[0002] The present invention relates to a redirecting element guide loop for a seat belt in a motor vehicle, vehicles, consisting of a one piece metal body with a fixing eye and a belt guide slit supplied with a rounded running surface and a cladding part consisting of plastic held on the metal body as well as of a displacement body which limits the slot width for the belt strap to run through.

[0003] A redirecting element with the above characteristics is described in DE 202 05 570 U1. In order to take up the belt strap load and to cover metal bodies bolted to the car body, in particular in the case of metal bodies built into the pillar of the motor vehicle so as to be covered or semi covered so that no metal areas are visible, a cladding part is held on the metal body, which, in the case of the embodiment described in DE 202 05 570 U1, consists of two side parts manufactured of plastic, which are each pushed onto the metal body from the side and are held together at the point where they strike against one another by

~~connectors formed at this point. In addition, the displacement body which covers the area of the metal body which exhibits the fixing eye is firmly placed on the metal body.~~

BACKGROUND OF THE INVENTION

[0004] A guide loop is described in US 4,861,070. A cladding part, in the form of a cap is placed on the body of the redirecting element. It includes, at its top end a wall section which extends over a shoulder formed on the top end of the body and holds the cladding part on the body by means of an interference or form fit. Opposite the wall section a bar is located on the cladding part, that is pushed into a slit of the body next to the belt guide slit. A disadvantage of this known redirecting element is that the interference or form fit between the wall section and shoulder requires precision processing of the parts, and the location of the bar makes providing any additional slits near the belt guide slit difficult.

[0005] The existing redirecting fitting is associated with the disadvantage that both individual parts which are needed to form the cladding part have to be manufactured and mounted separately, whereby the mounting operation is complicated because the connector device between the individual parts has to be threaded in. This presupposes precise manufacture as regards fitting characteristics not only of the individual components of the cladding part, but also of the metal body, in order that the connecting device fits when the redirecting fitting is mounted.

[0006] A guide loop is also described in DE 202 05 570 U1. In order to cover a metal body, which carries the belt load and is anchored to the vehicle, a cladding part is provided so that no metal areas can be seen. In the embodiment described in DE 202 05 570 U, the cladding consists of two side parts manufactured of plastic,

which are each pushed onto the metal body from the side and are held together at the point where they contact one another by connectors . In addition, a displacement body which covers an area of the metal body designed to receive a fixing eye is also coupled to the metal body. This guide loop has the disadvantage that the two separate parts needed to form the cladding part are manufactured and mounted separately, and the mounting operation requires additional connectors with the displacement body. As above, this requires precise manufacturing to maintain the fit, not only of the individual components of the cladding part, but also of the metal body so that the connectors fit when the redirecting element is mounted to, for example, a vehicle pillar.

[0007] The present invention is therefore based on the task of simplifying need to simplify the manufacture and mounting of a guide loop redirecting fitting with the and reducing the parts count while still providing the characteristics described at the beginning of this document above.

[0008] The solution of this task, including advantageous embodiments and further developments of the invention, results from the content of the patent claims which follow this description.

SUMMARY OF THE INVENTION

[0009] The basic concept on which the invention is based provides that the cladding part is formed as a one-piece body with edge areas which at least partially enclose the metal body and which can be firmly positioned on the metal body by means of pre-tensioning exercised on the metal body by the edge areas. The invention is therefore based on the concept of forming the cladding part as a unified and one-piece component to be attached to the metal body from one surface side of

~~the metal body, whereby the cladding part is to be placed on the metal body in only one assembly step. The cladding part should be dimensioned in such a way that in assembled state its edge areas lie on the metal body in pretensioned fashion and that thereby the cladding part is held firmly on the metal body. For this purpose it is only necessary to bend open the cladding part, consisting of plastic and therefore yielding to some extent, so far during assembly that it can be fitted over the metal body. From this results the advantage that only one manufacturing step is needed for manufacture of the cladding part and also only one assembly step is needed.~~

[0010] The present invention provides a guide loop having a metal body, a cladding part and a displacement body. The cladding part includes portions made of a flexible material, such as plastic, capable of being deformed and fitted over a metal body. In an assembled condition, the cladding part can be firmly placed on the metal body by means of tension within the cladding part applied to edges of the metal body.

[0011] The invention is based on the concept of forming the cladding part as a unified, one-piece component which can be positioned on the flat side of the metal body. The cladding part can be coupled to the metal body in only one assembly step, and is dimensioned in such a way that in the assembled state its edge areas clamp the edges of the metal body and secure the cladding part to the metal body. Tension within the cladding part is created by bending open the cladding part which is manufactured of plastic and therefore is capable of deforming, so that during assembly it can be fitted over the metal body. This has the advantage that only one manufacturing step is needed for the cladding part and only one assembly step is needed to couple it to the metal body.

[0012] The holder Retention of the cladding part can be improved in that if clip-type holders are formed ~~on the~~ in the cladding part metal body for holding retaining the cladding part on the metal body; in this context it can be useful if at least a part of the ~~edge areas enclosing the metal body is itself~~ edges of the cladding part include formed as a clip type holder.

[0013] ~~In so far as in one~~ Another embodiment of the invention forms the metal body, ~~in~~ body ~~in~~ a way which is ~~in fact already~~ known from DE 202 05 570 U1, is formed with a lower bar including an ~~an~~ outwards outwardly directed, open C-shaped cross section, ~~at its~~ lower bar which The bar forms a running surface for the belt strap, ~~it is provided for by one~~ and in this embodiment of the invention ~~that the~~ the cladding part ~~exhibits~~ includes a groove for acceptance of the ~~to accept~~ an outer walls of wall of the C-shaped cross section ~~at its~~ lower part ~~which encloses~~ to enclose the lower bar of the metal body.

[0014] According ~~to one~~ to yet another embodiment of the invention, ~~it is provided for that~~ the metal body ~~exhibits~~, ~~at its~~ includes ~~at the~~ upper edge which limits of the belt guidance slit, ~~near~~ towards the fixing eye, a course which is an edge angled several times ~~with a~~ and forming a tab projecting centrally ~~in the~~ into the belt guidance slit, ~~with a~~ A limiting edge running at an angle of approximately 45 degrees to the longitudinal axis of the belt guidance slit ~~and that is matched by a corresponding contour of the displacement body exhibits a contour of corresponding form for covering and covers~~ the part of the metal body which accommodates the fixing eye ~~including the~~ and tab; this involves the advantage that, This has the advantage, in contrast to the known form of the metal body, of providing more material ~~has been left~~ between the limiting edges and the fixing eye, which improves the strength of the metal body; ~~the displacement part is formed accordingly.~~

[0015] In a way which is in fact already known, it can be provided that the Also, in a known manner, the displacement body exhibits includes projections which extend into the fixing eye of the metal body and form an acceptance for to accept a fixing means. One embodiment of the invention provides that the The displacement body exhibits also includes lobes in its upper area which encloses enclose the fixing eye, which eye and extend beyond the contour of the metal body, as a limitation of means to limit the rotational path of the redirecting element built into the motor vehicle around the fixing means when the guide loop is secured to the motor vehicle.

[0016] With regard to simplification of To simplify mounting of the the redirecting fitting, according to one guide loop, another embodiment of the invention it can be provided for that the may provide a cladding part exhibits including a division formed by a slit in the area which surrounds the fixing eye. This eye; this division makes it easier to bend open the cladding part during fitting of the cladding part over the metal body; in body. In this embodiment, the displacement body, which, as in the state of the art is formed separately, is is a separate component clipped to the metal body, for which purpose corresponding clip holders can be provided.

[0017] In a further embodiment of the invention it is provided that the displacement body is formed in one as a single piece with the cladding part; in part. In this case the cladding part is in the form of a closed component and can preferably fixed be fixed to the metal body by means of included clip holders, which are correspondingly provided. In this This connection it can be provided for in allows an alternative manufacturing process, wherein the that the cladding part including and the displacement body is body are formed around the metal body in an injection molding process, thus realising the facilitating a one-piece form of displacement body and cladding part.

[0018] Further objects, features and advantages of this invention will become readily apparent to persons skilled in the art after a review of the following description, with reference to the drawings and claims that are appended to and form a part of this specification.

BRIEF DESCRIPTION OF THE DRAWINGS

[0019] Embodiments of the invention are shown in the drawings, which are described below.

[0020] Fig. 1 An individual view of the is a top, front perspective view of a metal body of a redirecting fitting, guide loop according to the present invention;

[0021] Fig. 2 A first is a first embodiment of a cladding element part of the guide loop in a front view, view according to the present invention;

[0022] Fig. 3 The object is the embodiment of Figure 2 in a rear view, view;

[0023] Fig. 4 The cladding part according to is a top, front perspective view of the embodiment of Figure 2; or Figure 3 in a further overall view,

[0024] Fig. 5 A displacement is a front view of a displacement body of the guide loop according to the present invention; in a front view,

[0025] Fig. 6 The object is the displacement body of Figure 5 in a top, front perspective view; an overall view,

[0026] Fig. 7 The displacement is the displacement body according to Figure 5 or Figure 6 in a state where of Figure 6 mounted to the metal body according to of Figure 1, in a top, front perspective view;

[0027] Fig. 8 A further is a front view of a second embodiment of the displacement body in the representation according to Figure 5, of Figure 5;

[0028] Fig. 9 The displacement is a top, front perspective view of the displacement body according to of Figure 8; in an overall view;

[0029] Fig. 10 The displacement is the displacement body according to Figure 8 or of Figure 9 in a state where mounted to the metal body according to of Figure 1, in a top, front perspective view;

[0030] Fig. 11 The displacement part in a different embodiment with is a front view of the cladding part and the displacement body formed in one piece, as a single piece;

[0031] Fig. 12 The object is the cladding part and displacement body of Figure 11 in an overall view, a top, front perspective view;

[0032] Fig. 13 The cladding part including is the guide loop of the present invention wherein the cladding part and the displacement part according to Figure 11 or body of Figure 11 12 in a state where are mounted to the metal body according to Figure 1. of Figure 1 shown in a top, front perspective view.

DETAILED DESCRIPTION OF THE INVENTION

[0033] In Figure 1, first the a metal body 10 of a redirecting element guide loop for use with a seat belt in a motor vehicles can be seen, which is vehicle is shown in fundamental agreement with the generic state of the art according to DE 202 05 570 U1. In detail, More particularly, the metal body 10, for example, which is preferably manufactured of steel plate by means of cold forming, exhibits includes an upper area 11 with a having a fixing eye 12 formed in it through which a fixing means, not shown, should (not shown), may pass for the fixing of to affix the metal body 10 to a vehicle component pillar. Following this, at the upper area 11, The metal body 10 expands from the upper area 11 into an area into which in which a belt guidance slit 13 is formed by means of transition into walls 16 having a C profile 15 with walls 16 at and separated by a corresponding distance from one another, whereby the A lower bar 14 of the metal body 10 is formed by the C profile 15 exhibits an in particular and includes a rounded running surface for the belt strap a webbing of the seat belt (not shown) which is guided through by belt guidance slit 13. The top limitation of the belt guidance slit 13, which is directed towards fixing eye 12 is formed by means of a course which is formed near the fixing eye 12, includes edges 18 which are angled several times with a forming a tab 14 tab 17 which projects centrally in belt into the belt guidance slit 13. The along with limiting edges 18 which run in run at an angle of approximately 45 degrees to the longitudinal axis of the belt guide slit 13, whereby a larger increasing the area of material is left between the limiting edges 18 and the fixing eye, which improves 12, improving the stability strength of the metal body 10.

[0034] In Figures Figures 2 to 4, first, in a illustrate a first embodiment, embodiment of a unified, single piece and one piece cladding part 19 of the guide

loop for use in conjunction with the metal body 10. The cladding part 19 is shaped to substantially match the contour of the can be seen, which is harmonised as regards its contour with the dimensions of metal body 10 in such a way that it lies securely on is secured to the metal body 10 solely by means of the pretensioning which is tension present in the cladding part 19. For this purpose, the cladding part 19, in addition to a A central opening 20 which allows space for the belt guidance slit 13 of metal body 10 including the area of metal body 10 which creates Tab 17, exhibits and the tab 17 of the metal body 10.

[0035] Looking more closely, the cladding part 19 includes in its top area quarter-circular segment-shaped shaped limitations 21 for partial enclosure of to partially enclose the fixing eye 12 of the metal body 10, whereby limitations. The limitations 21 are divided by a slit 22, so that a corresponding yielding quality to create a flexible portion of the cladding part 19 is created. Over a In addition, part of its circumference, outer perimeter, the cladding part 19 exhibits includes edge areas 25 which enclose the outer contour of the metal body 10., and further, in In the lower area of the cladding part 19 its area which covers or encloses the lower bar 14 of metal body 10 exhibits a groove 23 for accommodation of a is included to accommodate the wall 16 of the C-profile 15 of the lower bar 14 such that the lower part of the, so that in this area, cladding part 19 is held on metal onto the metal body 10 by means of an interference fit (see Figure 4). Further holding of The upper part of the cladding part 19 on metal is secured to the metal body 10 is achieved by means of the pre-tensioning which is tension exercised by the edge areas 25 crafted by flexing open the slit 22. As can be seen from Figure 3, Figure 3 illustrates the back of the cladding part 19 which, in the example shown, is not implemented in formed with a full cross-section on its smooth surface on the back (i.e. the side

which cannot be seen when it is installed), but is implemented with bridges includes ribs 24 formed by gaps in the material for increased rigidity.

[0036] In accordance with the state of the art The present invention also includes a displacement body 26 of the guide loop, similar to that described in DE 202 05 570 U1, a DE 202 05 570 U1. Various embodiments of the displacement body 26 shown in different embodiments are illustrated in Figures 5 to 7, either as a second component along with belongs to the one-piece cladding part 19 or as a single, integral component combined with the cladding part 19 shown in Figures 2 to 4, whose function is described in detail in the state of the art. The

[0037] Turning specifically to Figures 5 and 6, the displacement body 26 is provided to cover the upper area 11 of the metal body 10, has, when being assembled, an eye 27, which aligns with fixing eye 12 of metal body 10, in whose edge area, and a plurality of projections 28, are provided, which reach into The eye 27 aligns with, and the projections 28 extend into, the fixing eye 12, of metal body 10 are formed, by means of which it is prevented in mounted state that When the fixing means (not shown) for fixing of the redirecting fitting on the part element is fixed to the vehicle, the projections 28 prevent the fixing means (not shown) from contacting comes into contact with the edge area inner circumference of the fixing eye 12 of in the the metal body 10.

[0038] Furthermore, The displacement body 26 exhibits also includes a limiting bridge 29 which reaches over extends around the tab 17 of the metal body 10 and covers into the belt guide slit 13, of metal body 10 This limits, the overall operating height of the belt guide slit 13 by the thickness of the limiting bridge 29, in part, by means of which the gap width of the belt slit formed in the redirecting element is in the last analysis defined. In order to position secure the displacement body 26 firmly

~~on firmly onto the metal body 10, a clip projection 30 is formed in the upper area of the top edge of the displacement body 26; additionally, (see Figure 6). In addition, the projections 28 are projections 28 may also be provided with corresponding clip hooks 28a, so that to further secure and position the displacement body 26 can be firmly positioned on onto the metal body 10 as shown in Figure 7.~~

[0039] ~~The example of Another embodiment of the displacement body 26 which is shown in Figures 8 to 10. It basically differs from the embodiment shown in Figures 5 to 7 in that in its the upper area which encloses the fixing eye 12 of the metal body 10 displacement body 16 exhibits includes lobes 31. The lobes 31 which project over project beyond the contour of the metal body 10 and which serve as a limitation of to limit the amount of rotation path of the guide loop redirecting element which about the fixing means (not shown) when the guide loop is installed in the vehicle, round its fixing means. Furthermore, additional clip holders 32 are provided in the area of the limiting bridge 29 and enclose to secure the displacement body 26 to the limiting edges 18 of the metal body 10.~~

[0040] ~~In the case of the The embodiment finally shown in Figures 11 to 13, illustrates the cladding part 19 and the displacement body 26 are formed in formed as one piece, so that a uniform resulting in a unitary component results which can be manufactured in one process, a single process. Figure 13 illustrates the unitary components of the embodiment assembled onto the metal body 10 of Figure 1. Also note, in Figures 11 to 13, common numbers are used to denote common features with the embodiments of Figures 2 to 10. Such features function in a similar manner to their counterparts in the earlier embodiments, whereby The unitary component of this embodiment requires only one manufacturing assembly step is needed step and~~

one step assembling the unitary component onto the metal body 10 for manufacture
of to form the redirecting element guide loop of the present invention.

[0041] ~~The characteristics of the object of these documents which are described in the above description, the patent claims, the summary and the drawing can be of fundamental significance for the realisation of the invention in its various embodiments both individually and in any desired combinations with each other.~~

[0042] While the above description constitutes the preferred embodiment of the present invention, it will be appreciated that the invention is susceptible to modification, variation and change without departing from the proper scope and fair meaning of the accompanying drawings.